

## Activity 1

### Taking a Ride on a Lithospheric Plate

#### Think About It

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- How can you locate your position on the Earth's surface?
- How would you be able to determine whether your position on the Earth has moved?



## WHAT DO YOU THINK?

## Activity 1

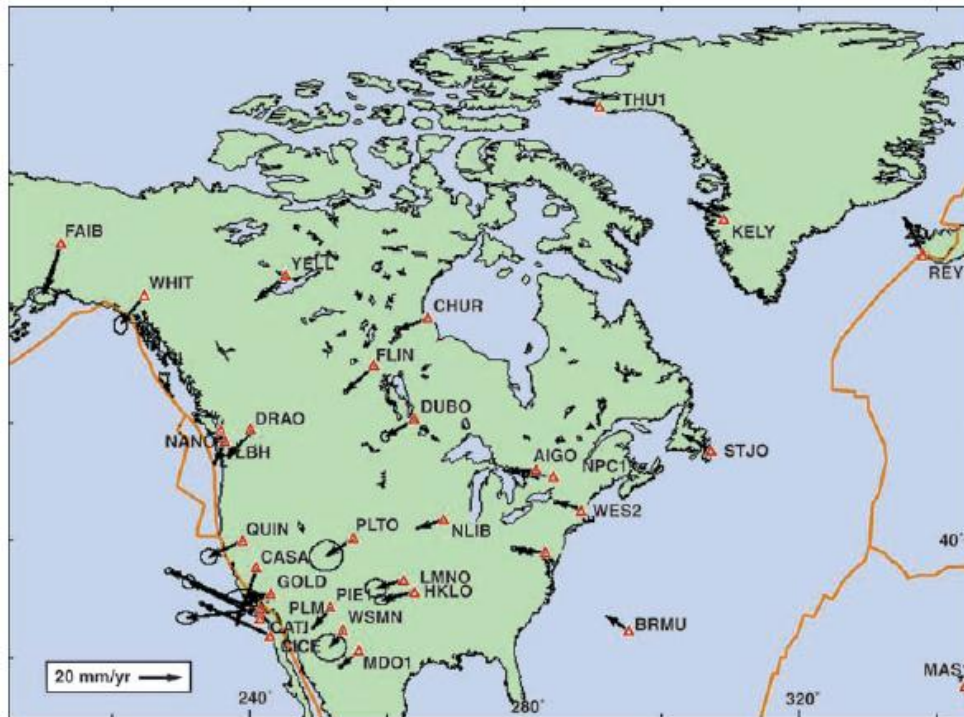
### Taking a Ride on a Lithospheric Plate

#### Investigate Part A

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1a. How do you know that the WES 2 station has moved over time?

1b. In what compass direction is the WES 2 station moving? Be specific.

1c. Is the WES2 station moving more than or less than 20 mm/yr? Explain.

1d. Are all stations on the map moving at the same speed? Explain.

1e. Are all stations on the map moving in the same direction? Explain.

1f. What is the general or average direction of movement of North America?

## Activity 1

### Taking a Ride on a Lithospheric Plate

#### Digging Deeper

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<http://www.brainpop.com/science/earthsystem/platetectonics/>

#### Crust

the thin outermost layer of the Earth

Continental crust

is thick and usually very old

Oceanic crust

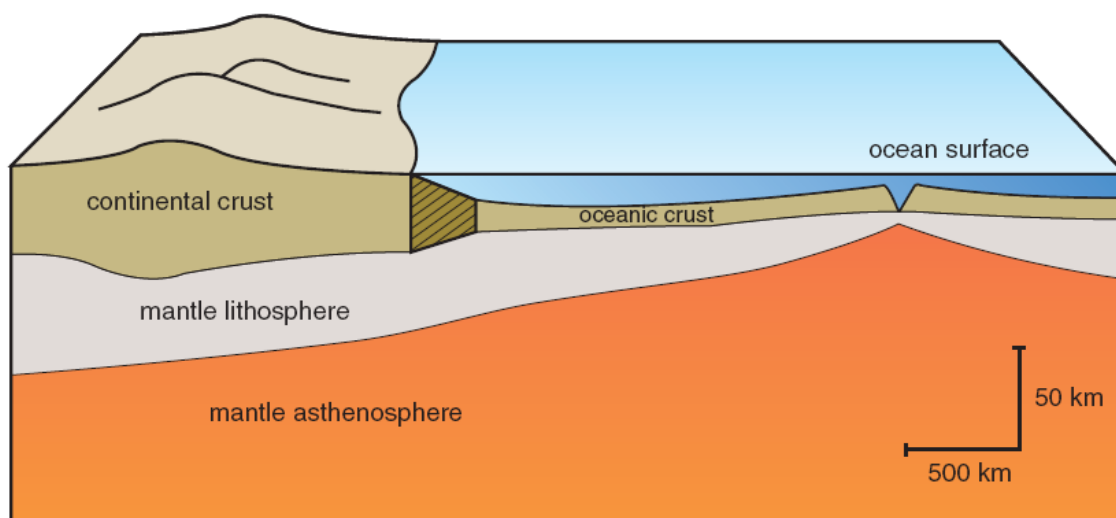
is relatively thin, and is always younger than continental crust

Ocean crust is more dense, or heavier than continental crust

#### Mantle

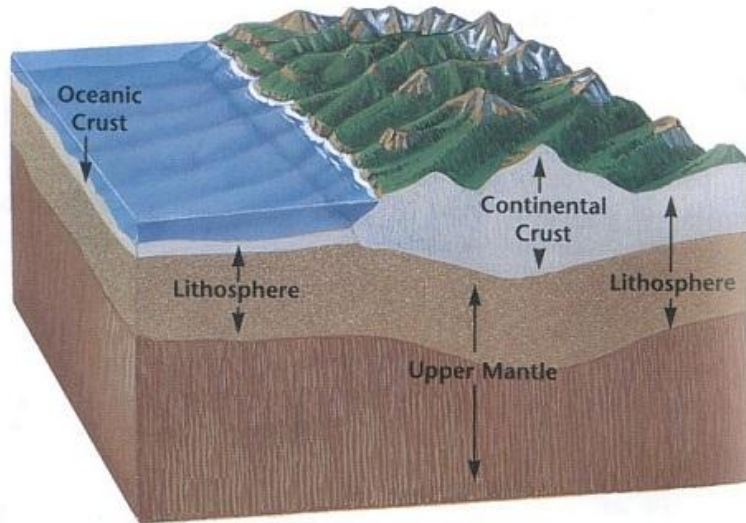
the zone of the Earth below the crust and above the core

It is divided into the upper mantle and lower mantle



## Lithosphere

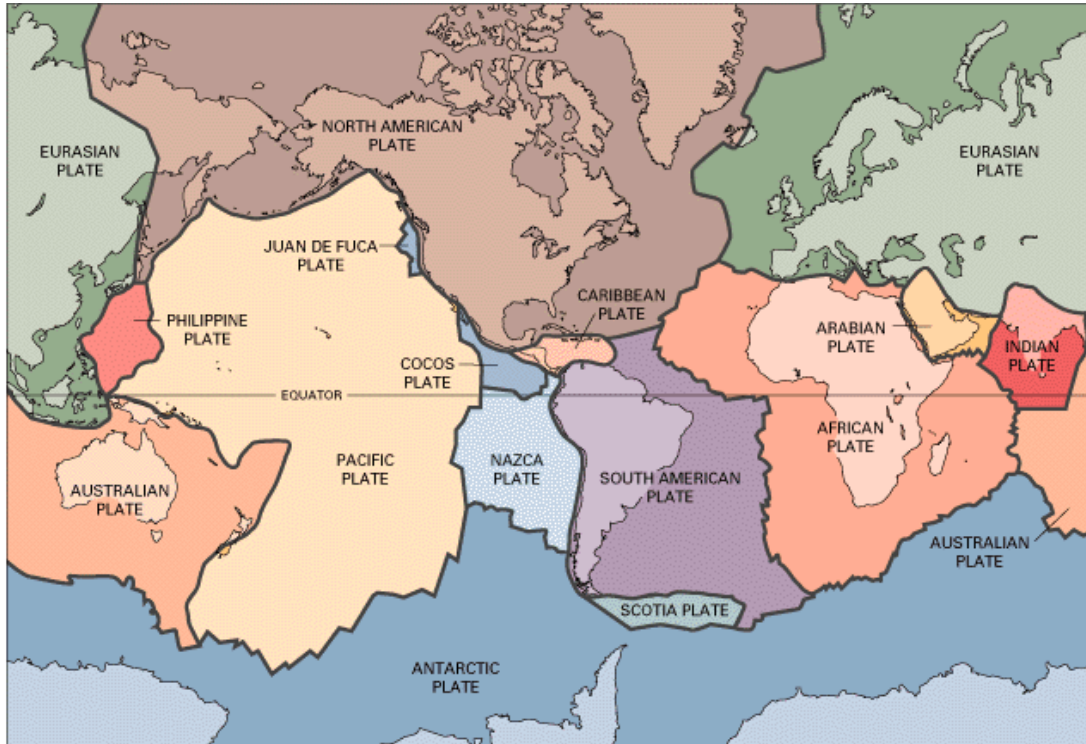
the outermost layer of the Earth, made of the Earth's crust and part of the upper mantle



The lithosphere is a rigid layer

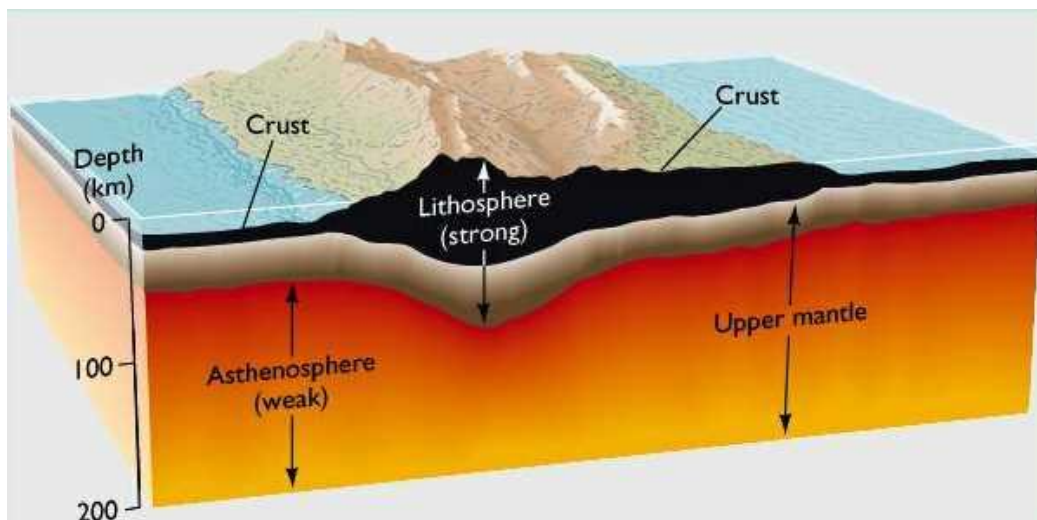
Earth's plates are made mostly of lithosphere

The less dense plates of the lithosphere “float” on the denser asthenosphere



## Asthenosphere

the part of the mantle below the lithosphere; it is like hot plastic and flows slowly

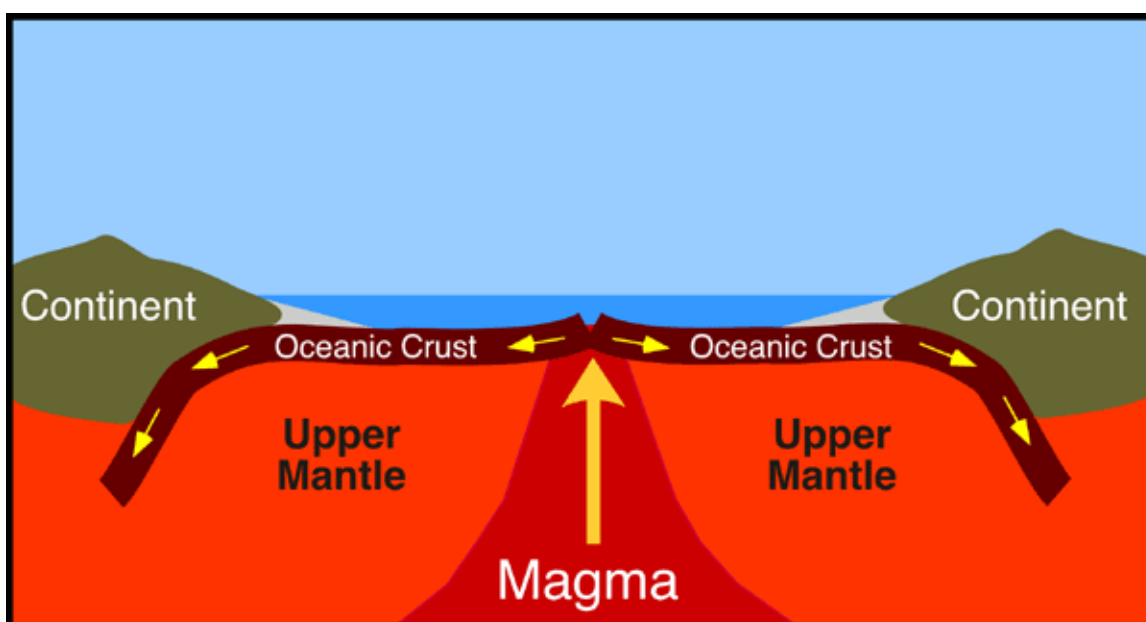


## GPS

Global Positioning System; it is a satellite system that locates points on the Earth

## Seafloor spreading

as the seafloor spreads apart, magma is forced upward and flows from the cracks to form new seafloor



<http://education.sdsc.edu/optiputer/flash/seafloorspread.htm>

[http://www.uwsp.edu/geo/faculty/ritter/animation/lithosphere/tectonics/sea\\_flr\\_spread\\_USGS\\_A55.gif](http://www.uwsp.edu/geo/faculty/ritter/animation/lithosphere/tectonics/sea_flr_spread_USGS_A55.gif)

[http://www.classzone.com/books/earth\\_science/terc/content/visualizations/es0804/es0804page01.cfm?chapter\\_no=visualization](http://www.classzone.com/books/earth_science/terc/content/visualizations/es0804/es0804page01.cfm?chapter_no=visualization)



Earth's magnetic field

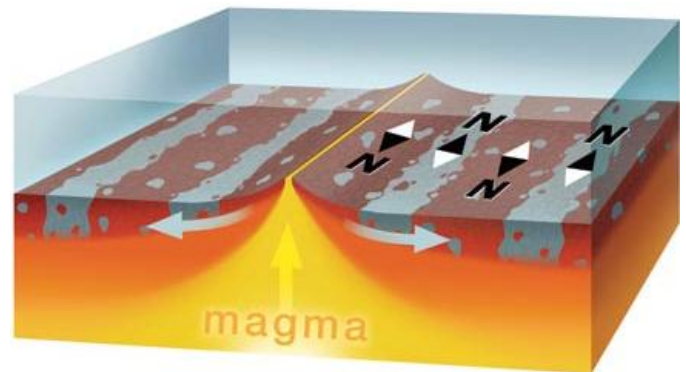
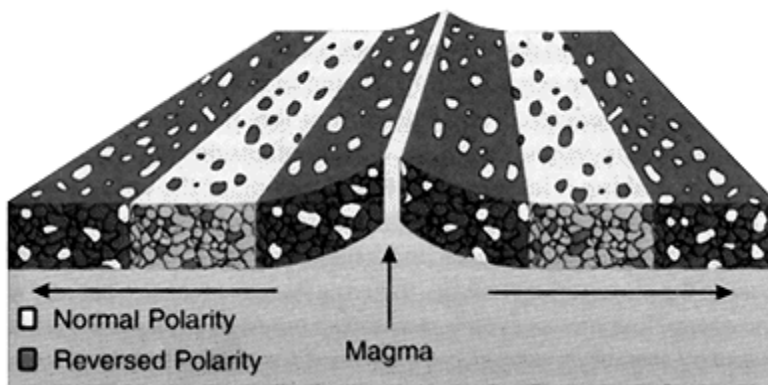
has a north and south pole that have reversed themselves many times in the past

Normal polarity

magnetic rocks in the seafloor match Earth's normal polarity (compass needle points north)

Reverse polarity

magnetic rocks in the seafloor match Earth's reverse polarity (compass needle points south)



As ocean crust forms, it obtains the polarity of the Earth's magnetic field at that time

Over time, a series of magnetic "stripes" are formed on the seafloor

<http://www.edumedia-share.com/media.php?id=1325>



## Mid-ocean ridge

a continuous mountain range on the bottom of the seafloor



Age evidence

scientists found that the youngest rocks were located at the mid-ocean ridge

The ages of the rocks become increasingly older further from the ridge



## Activity 1

### Check Your Understanding

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1. What is the difference between the lithosphere and the asthenosphere?

2. What does the abbreviation GPS stand for?

3. From where does a GPS receiver get its signal?

4. Why are GPS data not enough to confirm that the Earth's surface has been moving for many years?

5. What has caused the "striped pattern" in the rock of the ocean floor?